CLAIMS

1. A network node for metro area networking comprising:

a first wireless interface configured for coupling to a second network node; and

a media abstraction unit coupled to the link quality management unit and having a link quality management unit; and

a cross connect switch coupled to the media abstraction unit;

wherein the link quality management unit provides an available bandwidth of the wireless interface to the cross connect switch through the media abstraction unit.

2. The network node of Claim 1, wherein the link quality management unit is configured to adapt a plurality of transmission parameters of a transmission signal of the first wireless interface to in response to variable link conditions.

3. The network node of Claim 1, configured to transfer data using time division multiplexing.

4. The network node of Claim 1, further comprising a TDM user interface configured for data using time-division multiplexing.

5. The network node of Claim 1, wherein the link quality management unit comprises a transmission power control unit configured to control a transmission power level of the first wireless interface.

6. The network node of Claim 5, wherein the transmission power control unit comprises a received power level detector

coupled to measure a received power level of an incoming signal received by the first wireless interface.

7. The network node of Claim 1, wherein first link quality management unit comprises a modulation control unit configured to control the modulation rate of the first wireless interface.

8. The network node of Claim 7, wherein the modulation control unit comprises a signal quality detector coupled to measure a signal quality value of an incoming signal from the second network node.

9. The network node of Claim 8, wherein the signal quality detector is a bit error detector.

10. The network node of Claim 8, wherein the signal quality value is a bit error ratio.

11. The network node of Claim 8, wherein the signal quality value is transmitted to the second network node.

12. The network node of Claim 7, wherein the modulation control unit is coupled to receive a signal quality value from the second network node.

13. The network node of Claim 12, wherein the modulation control unit adjusts the modulation of the first wireless interface based on the signal quality ratio.

14. The network node of Claim 7, wherein the modulation control unit uses quadrature amplitude modulation.

15. The network node of Claim 14, wherein the modulation control unit uses quadrature phase shift keying.

16. The network node of Claim 1, wherein the link quality management unit comprises:

an error correction unit configured to generate error correction code for the first wireless interface; and

an ECC level control unit coupled to control a level of redundancy in the error correction unit.

17. The network node of Claim 16, wherein the error correction unit comprises:

a first ECC encoder; and

a second ECC encoder coupled to the first ECC encoder..

18. The network node of Claim 17, wherein the error correction unit further comprises a convolution unit coupled between the first ECC encoder and the second ECC encoder.

19. The network node of Claim 1, wherein the cross connect switch forms a transmission data frame having a payload size based on the available bandwidth.

20. The network node of Claim 19, wherein the transmission data frame comprises high priority data and low priority data.

21. The network node of Claim 19, wherein the high priority data comprises TDM data and packet data.

22. A method of operating a first network node coupled to a second network node by a wireless link, the method comprising:

adapting one or more transmission parameters in response to variable environmental conditions;

determining an available bandwidth of the wireless link; and

determining an available payload size based on the available bandwidth; and

forming a data frame having a payload smaller than or equal to the available payload size; and

23. The method of Claim 22, wherein adapting one or more transmission parameters in response to variable environmental conditions comprises adapting a transmission power level of the first network node.

24. The method of Claim 22, further comprising receiving a received power error value from a second network node.

25. The method of Claim 22 wherein adapting one or more transmission parameters in response to variable environmental conditions comprises adapting a modulation level of a transmission data stream in the first network node.

26. The method of Claim 25, further comprising receiving a signal quality value from a second network node.

27. The method of Claim 26, further comprising decreasing the modulation level when the signal quality value is less than a desired signal quality value.

28. The method of Claim 27, further comprising increasing the modulation level when the signal quality value is greater than a desired signal quality value.

29. The method of Claim 22,wherein adapting one or more transmission parameters in response to variable environmental conditions comprises adapting a level of error correction in the first network node.

30. The method of Claim 22, wherein the forming a data frame having a payload smaller than or equal to the available payload size comprises:

receiving a plurality pf TDM data columns;

receiving a plurality of high priority data packets;

receiving a plurality of low priority data packets; and

placing the TDM data columns in the payload;

placing the high priority data packets in the payload; and

placing a subset of low priority data packets in the payload.

31. The method of Claim 30, wherein the receiving a plurality of TDM data columns further comprises receiving an incoming TDM data frame containing a second subset of TDM data columns.

32. The method of Claim 31, wherein the receiving a plurality of TDM data columns further comprises receiving a third subset of TDM data columns from a TDM user interface.

33. The method of Claim 31, further comprising separating the second subset of TDM data columns into a plurality of DROP TDM data columns and a plurality of THROUGH TDM data columns.

34. The method of Claim 33, further comprising sending the DROP TDM data columns to a TDM user interface.

35. The method of Claim 33, wherein the outgoing TDM data frame contains the through TDM data columns.

36. The method of Claim 33, wherein the outgoing TDM data frame contains a third subset of TDM data columns from a TDM user interface.

37. The method of Claim 30, wherein the receiving a plurality of high priority data packets further comprises receiving an incoming TDM data frame containing a second subset of high priority data packets.

38. The method of Claim 37, wherein the receiving a plurality of high priority data packets further comprises receiving a third subset of high priority data packets from a packet user interface.

39. The method of Claim 37, further comprising separating the second subset of high priority data packets as DROP data packets and THROUGH data packets.

40. The method of Claim 39, wherein the DROP data packets are sent to a packet user interface.

41. The method of Claim 39, wherein outgoing TDM data frame contains the THROUGH data packets.

42. The method of Claim 41, wherein the outgoing TDM data frame contains a third subset of high priority data packets from a packet user interface.

43. The method of Claim 30, wherein the receiving a plurality of high priority data packets further comprises receiving an incoming TDM data frame containing a second subset of low priority data packets.

44. The method of Claim 43, wherein the receiving a plurality of high priority data packets further comprises receiving a third subset of low priority data packets from a packet user interface.

45. A system for operating a first network node coupled to a second network node by a wireless link, the system comprising:

means for adapting one or more transmission parameters in response to variable environmental conditions;

means for determining an available bandwidth of the wireless link; and

means for determining an available payload size based on the available bandwidth; and

means for forming a data frame having a payload smaller than or equal to the available payload size; and

46. The system of Claim 45, wherein the means for adapting one or more transmission parameters in response to variable environmental conditions comprises means for adapting a transmission power level of the first network node.

47. The system of Claim 46, further comprising means for receiving a received power error value from a second network node.

48. The system of Claim 47 wherein the means for adapting one or more transmission parameters in response to variable

environmental conditions comprises means for adapting a modulation level of a transmission data stream in the first network node.

49. The system of Claim 48, further comprising means for receiving a signal quality value from a second network node.

50. The system of Claim 49, further comprising means for decreasing the modulation level when the signal quality value is less than a desired signal quality value.

51. The system of Claim 50, further comprising means for increasing the modulation level when the signal quality value is greater than a desired signal quality value.

52. The system of Claim 45,wherein the means for adapting one or more transmission parameters in response to variable environmental conditions comprises means for adapting a level of error correction in the first network node.

53. The system of Claim 45, wherein the means for forming a data frame having a payload smaller than or equal to the available payload size comprises:

means for receiving a plurality pf TDM data columns;

means for receiving a plurality of high priority data packets;

means for receiving a plurality of low priority data packets; and

means for placing the TDM data columns in the payload;

means for placing the high priority data packets in the payload; and

means for placing a subset of low priority data packets in the payload.